

WHAT IS CLAIMED IS:

1. A metrology instrument for measuring and inspecting deviations between a pair of elements of a pattern to be stitched within an image, said metrology instrument comprising:

a means for obtaining an image pattern for inspection, said image pattern having a stitching part at which a pair of elements of said image pattern are stitched to each other along a straight boundary line extending along said stitching part;

a ΔX -measuring device for measuring deviation ΔX between stitched elements of said image pattern along said straight boundary line;

a storing means for storing two sets of data about images indicating dose distributions in memory, said dose distributions being calculated by a simulation method under the condition that an energetic beam is used when said elements of said pattern are transferred;

an image superimposing means for shifting one of the images indicating the dose distributions by said ΔX along said straight boundary line and by a desired amount ΔY in a direction vertical to said straight boundary line relatively to the other and superimposing both of said images indicating the dose distributions; and

an image comparator for taking the correlation between image data obtained for said inspection and image data produced by the superimposing by comparing these two kinds of image data.

2. The metrology instrument of claim 1, wherein there are further provided a decision device for making a decision based on said correlation as to whether said ΔY should be updated and a ΔY -setting device for resetting ΔY if said ΔY is updated, and wherein said ΔY is updated until said correlation becomes less than a given value.

3. The metrology instrument of claim 1, further comprising a ΔY -setting device for updating the value of ΔY a set number of times and a decision device for detecting the value of ΔY that minimizes said correlation.

4. The metrology instrument of any one of claims 1-3, wherein image data about dose distributions of plural pattern shapes are stored in memory.

5. A metrology method for measuring and inspecting deviations between a pair of elements of a pattern to be stitched within an image, said method comprising the steps of:

obtaining an image pattern for inspection, said image pattern having a stitching part at which a pair of elements of said image pattern is stitched each other along a straight boundary line extending along said stitching part;

measuring deviation ΔX between stitched elements of said image pattern along said straight boundary line;

storing two sets of data about images indicating the dose distributions in memory, said dose distributions being calculated by a simulation method under the condition that an energetic beam is used when said elements of said pattern are transferred;

shifting one of the dose distribution images by said ΔX along said straight boundary line and by a desired amount ΔY in a direction vertical to said straight boundary line relatively to the other and superimposing both of the dose distribution images; and

taking the correlation between image data obtained for said inspection and image data produced by the superimposing by comparing these two kinds of image data.

6. The metrology method of claim 5, further comprising the steps of:
making a decision based on said correlation as to whether said ΔY should be updated;
resetting said ΔY if updated; and
updating said ΔY until said correlation decreases below a certain value.

7. The metrology method of claim 5, further comprising the steps of:
updating said ΔY a set number of times; and
detecting the value of ΔY which minimizes said correlation (i.e., maximizes the degree of similarity).

8. The metrology method of any one of claims 5-7, further comprising the step of storing image data about dose distributions corresponding to plural pattern shapes in memory.